The Niagara River Toxics Management Plan

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Niagara River Secretariat
July 1993

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1.0 INTRODUCTION

On February 4, 1987, the heads of four environmental agencies in the U.S. and Canada signed a document known as the "Declaration of Intent" (Appendix I), which outlines the principles to be followed in the pursuit of a common goal to reduce loadings of toxic chemicals to the Niagara River through appropriate joint activities and separate agency activities. The agencies involved are the U.S. Environmental Protection Agency (EPA), Environment Canada (EC), the New York State Department of Environmental Conservation (DEC), and the Ontario Ministry of Environment and Energy (MOEE).

The Declaration of Intent, combined with a detailed Workplan, which is updated regularly, is entitled The Niagara River Toxics Management Plan (NRTMP). Through implementation of the NRTMP, the four agencies are committed to significant reductions in toxic chemical loadings to the Niagara River.

2.0 BACKGROUND

The Niagara River is a 37-mile (60-kilometer) channel that connects Lake Erie to Lake Ontario. Divided into upper and lower reaches by Niagara Falls, it provides 83% of the total tributary flow to Lake Ontario. A map of the Niagara Study Area is included as Figure I.

In February 1981, the Niagara River Toxics Committee (NRTC), made up of technical staff from the four agencies, was established to oversee and coordinate a major bi-national investigation of toxic chemicals entering the Niagara River. After completing its work, the NRTC issued a comprehensive report and recommendations in October of 1984. Soon thereafter, each of the four agencies developed specific action plans and special initiatives in response to that report and its recommendations.

Continued discussions among the four agencies brought about a consensus on the need for a long-term, bi-national commitment on joint and coordinated actions, beginning with river monitoring. By October of 1986, the first attempt at a comprehensive work plan was completed by technical staff from the four agencies. By February of 1987 an overall policy direction had been agreed to, along with specific commitments for the reduction in Niagara River loadings of persistent toxic chemicals of concern by 50% by 1996. The Niagara River Toxics Management Plan officially began with the signing of the Declaration of Intent, and the signers became known as the Four Parties. The NRTMP Workplan is updated regularly to report progress in meeting Plan commitments, and to present follow-up commitments.

The Four Parties published the last update in 1990. The 1993 update presents progress against commitments and other activities, and presents commitments for the Plan as it evolves to address toxic chemical reduction issues.

3.0 ACCOMPLISHMENTS TO DATE

Since the release of the Niagara River Toxics Committee Report in the fall of 1984, the Four Parties, acting individually and together, have undertaken a variety of initiatives. Some of the major accomplishments of the Four Parties since that time are:

- MOEE, DEC and EPA have reported a reduction of the loadings of toxics to the Niagara River from Canadian and U.S. point sources by more than 80 percent, as compared with the levels in 1981-'82.

- The Four Parties have agreed on sampling and analytical protocols, for monitoring the ambient Niagara River water column; the ambient water quality data developed using these protocols serve as the primary basis for other analytical efforts under the NRTMP.

- The Four Parties determined that eighteen toxic chemicals are problems in the Niagara River/Lake Ontario ecosystem. We are continuing to assess additional chemical data for possible expansion of this list.

- The Four Parties determined that a subset of the eighteen problem chemicals has significant Niagara River sources; they are the chemicals subject to the 50 percent reduction requirement of the Declaration of Intent. Ten chemicals are already listed, and we are continuing to assess additional chemical data for possible expansion of this list.

- The 1986/87 base-year loadings to the Niagara River from point sources of the ten priority toxic chemicals were calculated, and the non-point loadings estimated by inference. This is the basis for specific numerical load reduction targets for the 50 percent reduction commitment. Targets will be refined as the data base is improved.

- EPA and DEC issued a report in 1989 identifying the Falls Street Tunnel as responsible for greater than 50% of the aggregate point source loadings of the ten chemicals to the Niagara River from the U.S. (NRTMP bibliography #9). In March 1993, the U.S. Department of Justice lodged a settlement in Federal Court concluding the last phase of litigation which commits the City of Niagara Falls to treat all the dry-weather flow. Engineering analysis shows that the Niagara Falls Waste Water Treatment Plant will be removing virtually all of four of the six priority chemicals found in the Falls Street Tunnel discharge (benz(a)anthracene, mirex, PCBs, and hexachlorobenzene), 85 percent of the tetrachloroethylene, and 70 percent of the mercury when treatment starts in October 1993.

- The MOEE is issuing a report in July 1993 which contains data on all Canadian point sources to the river system. Using standardized procedures and including all data from the program, loadings were recalculated from 1986-87 to 1990-91. Results indicate a reduction for the 18 NRTMP chemicals of concern of greater than 75%.

- EPA and DEC identified twenty-five hazardous waste sites in the U.S. estimated to contribute 99.9 percent of the toxic chemical loading from all hazardous waste sites in the U.S. to the Niagara River. Ambitious schedules intended to drive cleanup of these twenty-five sites were established. The expected reduction of toxics loadings is an estimated 86 percent by 1996, and 99 percent by 1998.

- More than 7,600 cubic yards of highly contaminated sediment were removed from Gill Creek, eliminating, among other pollutants, an estimated 0.44 pounds (0.20 kg) per day load of PCBs to the Niagara River. This magnitude of loading is approximately 20 percent of the loading measured from the Niagara River to Lake Ontario.

- Bloody Run Creek, also associated with leachate from a hazardous waste landfill, was also excavated.

- A Remedial Investigation/Feasibility Study was completed in December 1991 for Pettit Flume inlet cove, a source of contaminated water and sediment to the Niagara River. A Record of Decision, issued in March 1992, specified excavation and treatment of contaminated soil, sediment, and dense non-aqueous phase liquid (DNAPL), and restoration of the Inlet Cove as a wetland area.

- In 1991, a consultant investigated the five Ontario landfills in the basin identified as potentially contributing chemicals to the Niagara River. The potential loading of EPA Priority Pollutants was estimated to be 30 kg/day (66 lbs/day) from these five sites. None of the NRTMP chemicals of concern were found. A follow-up study of the four landfills under MOEE jurisdiction in 1993 confirmed these low loadings (1993 estimate - 12 kg/day). More extensive sampling is planned to verify the existence of trace levels of several compounds measured at some of these landfills.

- One Canadian site under federal jurisdiction is currently under investigation to confirm the presence of low level groundwater contamination and potential input to the Niagara River.

- Environment Canada's Great Lakes Cleanup Fund supported the successful removal of 230 cubic meters of sediment from the

Welland River using an innovative dredging technology. Discussions are underway for a full-scale cleanup operation.

- The Four Parties identified certain toxic chemicals entering the Niagara River from Lake Erie at elevated levels. We brought this issue to the attention of the International Joint Commission, and representatives from Canadian and US agencies met in April, 1993 to discuss a Lakewide Management Plan (LaMP) for Lake Erie.

The 1990 NRTMP provided the status of NRTMP activities from February 1987 through April 1990. Appendix II presents the most recent progress against commitments outlined in the 1990 Update. Each activity is either reported as completed, or brought forward in the same or in modified form in the updated Plan.

4.0 THE PLAN

The fundamental goal of the Niagara River Toxics Management Plan is to reduce the loadings of toxic chemicals to the Niagara River. The Plan proposed to achieve reductions by accomplishing four objectives.

- Sorting chemicals as a basis for action,
- Implementing programs to reduce the loadings of toxics entering the Niagara River,
- Assessing the success of programs to reduce the loadings of toxics, ensuring a continuing focus on critical inputs, and
- Coordinating NRTMP activities with Remedial Action Plan (RAP) activities.

Sorting chemicals as a basis for action has largely been accomplished with the identification of the eighteen priority chemicals. While the agencies continue to examine data on ambient levels of toxics for identification of new chemicals for priority attention, sorting chemicals will be incorporated under "Assess". Likewise, RAP activities are under way, and now are being incorporated into the agencies' programs under all objectives.

The Four Parties have refocused their efforts on the following priorities:

A. Reduce: Implementing programs to reduce the loadings of toxics entering the Niagara River and the risk they pose to the environment and human health;

B. Identify: Looking for new sources of toxics to the river to be targeted by the agencies for enforcement/reduction actions; and

C. Assess: Assessing the success of programs to reduce the loadings of toxics, ensuring a continuing focus on critical inputs.

The activities and schedules of the 1993 Update of the NRTMP are presented in Appendix III. A discussion of these commitments follows.

4.1 REDUCE

The first priority of the Plan is to implement programs to reduce the loadings of toxics entering the Niagara River.

In order to address this priority, the Four Parties have developed commitments under the Plan to reduce the loadings of toxic chemicals, that is, to:

- Reduce the loadings from point sources to the river,
- Reduce the loadings from non-point sources to the river,
- Foster reduction of the upstream loadings to the river from Lake Erie,
- Foster pollution prevention in the basin,
- Communicate with the RAP committees in areas of mutual concern.

4.1.1 Point Sources:

Inputs of toxics to the Niagara River from point sources have been identified and are being addressed in accordance with U.S. and Canadian point source plans.

The 1988 Revision of the NRTMP included commitments to:

- Present Canadian and U.S. plans to reduce the point source loadings of the chemicals on the list for 50 percent reduction, under the Declaration of Intent; and
- Prepare reports on the overall status of the Canadian and U.S. point source control programs.

To meet these commitments, the agencies issued six reports. The highlights of these reports are:

- Between 1981/82 and 1985/86, there was more than an 80 percent reduction in the loadings of toxics to the Niagara River from point sources in Canada and the U.S.. In addition, the Four Parties committed to reduce point sources of Niagara River priority toxics by 50 percent from 1986/87 levels, over and above, the reduction already seen.

- The agencies have identified the point source discharges that contribute one or more of the ten chemicals that are targeted for 50 percent reduction by 1996, as compared to the base year of the Declaration of Intent, that is, 1986-'87; and

- The agencies have plans in place to attain the 50 percent reduction goal for point sources to the river.

  - U.S.: DEC and EPA have reported that the discharge from the Falls Street Tunnel made up a major fraction of the total loadings of most of the measured priority chemicals for the three years for which DEC measurements were available ("Reduction of Toxic Inputs to the Niagara River from Point Sources," DEC, June 1989). Under the terms of a 1993 settlement with the City of Niagara Falls to treat the entire dry-weather flow from the Falls Street Tunnel, benz(a)anthracene, mirex, PCBs, and hexachlorobenzene will be virtually eliminated and tetrachloroethylene and mercury, reduced by about 85 percent and 70 percent, respectively.

  - Canada: Improved treatment and redirection of process discharges from the river to the local sewage treatment plants has resulted in significant toxics reduction. Data from the first six years of point source monitoring under the NRTMP indicate that a greater than 75% reduction in loadings has likely been achieved. Further toxics reduction is expected under the MISA program.

Beginning with the 1990 Update, the Four Parties committed to simplify these reports into a Canadian report and a U.S. report that meet the full range of the point source commitments. MOEE plans to release their report in July 1993. The U.S. will finalize its interim report after the permit is issued to the Niagara Falls Waste Water Treatment Plant.

Municipal/Industrial Strategy for Abatement (MISA):

In 1986, the MOEE initiated a comprehensive program to achieve toxics reduction in discharge to Ontario's waters. An extensive sampling program was carried out under regulation. Using data from this monitoring program and investigation of Best Available Treatment for each industrial sector, discharge regulations are now being developed and implemented. The program has been expanded to include:

- non-toxicity of effluents,
- pollution prevention concepts,

- no cross-media transfer of toxics, and
- a call for bans or phase-outs of 21 persistent toxic chemicals.

4.1.2 Non-Point Sources

Unlike point sources, the non-point source components of the Niagara River loadings of the ten chemicals have not yet been directly measured. There is, therefore, no current basis for a comprehensive identification of the individual sources contributing to the non-point loadings. However, the Four Parties have estimated the toxics loadings at known sources wherever possible as they work to reduce them, as described below.

4.1.2.1 Waste Sites:

To proceed as expeditiously as possible to the implementation of non-point control programs, EPA and DEC have focused initially on the remediation of hazardous waste sites contributing toxic chemicals to the Niagara River. Having identified twenty-four hazardous waste sites in the U.S. estimated to contribute 99.9 percent of the toxic chemical loading from all waste sites in the U.S. to the Niagara River, EPA and DEC presented ambitious schedules intended to drive cleanup of these sites. In November 1989, EPA and DEC issued a report on the hazardous waste sites in the U.S. contributing toxics to the river. EPA and DEC added another site, Frontier Chemical, to the list and issued a status report and plan update on U.S. waste sites in March 1993. The best estimate of the potential toxic chemical loading from these sites to the river (694 pounds per day or 315 kilograms per day) is anticipated to be reduced by 86 percent by 1996, and 99 percent by 1998. The two U.S. agencies will continue to closely track the cleanup schedules, issuing another U.S. status report in July 1993.

Highlights of U.S. waste site cleanups:

- DuPont has completed all remedial actions at its Buffalo Avenue plant, providing hydraulic containment of the toxics at the site.

- DuPont has also installed a grout curtain around its Necco Park facility, and is now pumping and treating contaminated groundwater from three recovery wells on the site.

- Occidental Chemical has contained contaminated groundwater with a drainage system at its Hyde Park site, and extracts and treats both the water and the associated non-dissolved toxics on-site.

- Occidental Chemical and Bell Aerospace have excavated 3000 tons and 1225 tons, respectively, of contaminated soil from their sites.

MOEE issued a report on the five Canadian waste sites in January 1991. MOEE estimates that no loads of priority toxics come from Canadian waste sites. Improvements have been made at all waste sites to reduce the potential for contaminant migration. A follow-up study in 1993 confirmed these low loadings (1992 estimate - 12 kg/day). More extensive sampling is planned to verify the existence of trace levels of hexachlorobenzene, mercury, tetrachloroethylene and lead at some of these landfills. A site remediation plan will be implemented at the Cyanamid, Welland site in 1993-94.

In general, the most difficult area to remediate with respect to some hazardous waste sites is groundwater with non-aqueous phase liquid (NAPL) contamination. Of particular concern is contaminated groundwater in the bedrock, adjacent to the Niagara River.

4.1.2.2 Other Non-Point Sources:

The Four Parties recognize the need to focus also on non-point sources other than hazardous waste sites. DEC issued non-point source assessment and program status reports in 1989 and 1990, respectively. The Four Parties agreed to report on reductions in non-point source loadings to the river. Recent actions to curb non-point source loadings were highlighted in the January 1993 report, "Progress Report on Reduction of Priority Toxics in the Niagara River."

EPA has funded a pilot Clean Sweep project in Erie County to assist farmers to safely dispose of stores of their banned or unregistered pesticides. Ontario has similar on-going programs for pesticide container and household hazardous waste collections.

The Region of Niagara and local municipalities together with the MOEE are carrying out "Infrastructure Needs Studies" in the cities of Welland and Niagara Falls. Studies have already been completed in Fort Erie and Niagara-on-the-Lake. These studies investigate the entire sewer systems and point out deficiencies that require correction which will, among other results, minimize combined sewer overflow occurrences, resulting in improved water quality in the receiving waterbodies.

Activities planned for the near term include:

- Cleanup of contaminated sediments in the Welland River,

- o Cleanup of PCBs in Lyons Creek, and
- o Remediation and restoration of the Pettit Flume Inlet Cove as the third phase of the Occidental Durez site cleanup which is being addressed under a CERCLA consent order.

DEC and MOEE will continue biomonitoring to confirm the effectiveness of cleanups in reducing toxics loads to the Niagara.

4.1.3 Upstream Loadings:

Six of the eighteen NRTMP priority toxics have, in some years, exceeded the most stringent water quality criteria at Fort Erie: chrysene (1986/87 and 1987/88); PCBs (1986/87 and 1987/88); benz(a)anthracene (1988/89); benzo(b/k)fluoranthene (1987/88); and mercury (1987/88 and 1988/89). This suggests that there are upstream Great Lakes sources for these toxics.

The Four Parties alerted the International Joint Commission, by letter dated March 22, 1989, that Lake Erie water entering the Niagara River contains elevated levels of the six toxic chemicals. Representatives from responsible U.S. and Canadian agencies met in April 1993 to discuss a Lake Erie Lakewide Management Plan (LaMP).

4.1.3.1 Canada/Ontario Water Quality Criteria

Canada and Ontario provide for ecosystem protection through the development of environmental quality criteria. Criteria relating specifically to the aquatic environment include the following:

- o human health protection is provided through:
  - Ontario Drinking Water Objectives
  - Canadian Food Residue Guidelines are translated into fish consumption advisories, published each year, in the Guide to Eating Ontario Sport Fish.
  - Guidelines for Canadian Recreational Water Quality.
- o aquatic life protection is provided through Canadian Water Quality Guidelines (1991), and Ontario's Provincial Water Quality Objectives and Guidelines (1992). Approximately 150 criteria have been developed. These criteria establish safe concentrations for indefinite exposures to toxic contaminants and are based on laboratory toxicity information.
- o for wildlife protection, Canada has proposed a protocol and several tissue residue guidelines for toxic substances which will protect fish, birds and mammals at the top of the food chain.

- sediment quality criteria for the protection of benthic organisms has been published in Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario (1992). Nearly 50 guidelines ensure that clean areas are protected from degradation from lakefilling and dredging activities.

- Ontario is documenting existing implementation procedures for the use of Provincial Water Quality Objectives and Guidelines for the protection of aquatic life.

4.1.3.2 U.S. Water Quality Guidance for the Great Lakes System:

Toxic chemical loadings to the Niagara River from Lake Erie and upstream are expected to decline as the U.S. Water Quality Guidance for the Great Lakes System is implemented. As required by the Great Lakes Critical Programs Act, EPA and eight Great Lakes states have initiated development of this guidance for minimum water quality criteria and controls that will be applied consistently by all of the Great Lakes States and Indian Tribes to maintain, protect, and restore the Great Lakes resource. Specifically, the proposed guidance consists of six interconnected procedures:

1. Derivation of criteria for the protection of aquatic life;
2. Derivation of criteria for the protection of human health;
3. Derivation of criteria for the protection of wildlife;
4. Use of bioaccumulation factors in calculating criteria;
5. Protection of current water quality (antidegradation); and
6. Expression of standards as regulatory controls (implementation).

EPA has formally proposed the guidance, and will take public comments through September 13, 1993, then publish final guidance in the spring of 1994. States and Indian Tribes are then required to adopt water quality standards, implementation procedures, and anti-degradation policies consistent with the guidance within two years after it is published.

The Canadian/United States Great Lakes Water Quality Agreement Binational Executive Committee is encouraging both countries to resolve the issue of common water quality objectives. In the U.S., the Great Lakes Water Quality Guidance will serve as the starting point for discussions. In Canada, established guidelines and procedures from both the federal government and province of Ontario will be used.

4.1.4 Pollution Prevention:

In order to make further progress towards the goal of virtual elimination of toxic discharges as embodied in the Great Lakes Water Quality Agreement, the Four Parties are committed to evaluating how pollution prevention activities (for example, source reduction) can be incorporated in the Plan.

In particular, the Four Parties have developed Pollution Prevention Initiatives to encourage waste minimization on both the U.S. and Canadian sides of the Niagara River. The pollution prevention initiatives build on, and are complementary to, the existing pollution prevention activities of the individual agencies.

The key objectives of the U.S. plan have been to:

- o Determine how industrial facilities located in the Niagara River/Lake Ontario basin can better apply pollution prevention techniques to reduce their releases of toxic chemicals to air, land, and water; and
- o Develop a joint industry/governmental initiative on pollution prevention.

Recent U.S. pollution prevention actions include:

- o EPA inspected Niagara River basin facilities for waste minimization activities. The targeted facilities discharge either NRTMP priority toxics or toxics that have high bioaccumulative factors. Inspectors instruct facility operators on pollution prevention alternatives that will reduce discharges of these toxics. EPA contractors have assessed four facilities for air emissions, and plan inspections before August 1993. Two facilities discharging point source effluents were inspected and a third inspection is planned. The final reports for inspections will include the facility manufacturing process, waste generation and environmental releases, a description of waste minimization achievements, an explanation of potential waste minimization opportunities, and the facility response to the evaluation. EPA Hazardous Waste Compliance section will complete inspections at 50 generators/handlers of the 18 priority toxics located in the Great Lakes by the end of 1993.
- o New York State industries have joined EPA's 33/50 Program, a voluntary initiative to reduce releases and off-site transfers of a targeted set of 17 + 1 toxic chemicals by 33 percent by the end of 1992 and by 50 percent by the end of 1995. The EPA invites companies to participate in this program by examining their own processes and products in

order to identify and implement cost-effective pollution prevention practices for these chemicals. A 1991 toxic inventory report released by NYSDEC shows that releases from all state facilities of the 17 + 1 toxics have declined by 45 percent from the 1988 baseline year, well ahead of the target schedule. In the coming year, EPA will contact those New York State companies that have made a corporate commitment to the 33/50 program to obtain their reductions schedules.

- DEC has assisted industry since 1990 by producing industry-specific pollution prevention fact sheets. At the same time, it instituted a household hazardous waste program.

- DEC now conducts multi-media facility inspections in the Niagara River basin. A single DEC contact person has also been named for individual facilities.

- In 1992, DEC formally established a Pollution Prevention/Multimedia Unit that is developing regulations requiring industries to draft plans to reduce the generation of hazardous waste and the release of toxic substances to air and water.

- DEC has sponsored a pollution prevention conference every year since 1987 of prominent industries on waste minimization and recycling.

- EPA has funded a pilot program in Erie County to instruct municipal pretreatment inspectors in pollution prevention techniques.

The key objectives of the Canadian plan have been to:

- Facilitate and highlight government-industry cooperation in achieving source control and virtual elimination of persistent toxic substances.

- Identify opportunities for partnership or information sharing leading to the development and implementation of pollution prevention projects; and

- Provide a visible means of documenting and tracking progress of specific commitments made to source control and virtual elimination of persistent toxic substances within the Lake Ontario/Niagara River geographic context.

Recent Canadian pollution prevention actions include:

- MOEE has established a pollution prevention office which has recently announced it Pollution Prevention Pledge Program

(P4). This voluntary program encourages industries to register with the program which then commits them to carry out actions to reduce toxics usage, therefore reducing toxics discharges. Targets for toxics reduction are 50% by 1995 and 90% by the year 2000. A number of other pollution prevention initiatives are underway, for example:

- National Pollutant Release Inventory,
- Accelerated Reduction or Elimination of Toxics (both programs in cooperation with EC), and
- Green Industry Assessment and Retrofit Program.

- o EC and MOEE, in cooperation with the City of Niagara Falls, are supporting a project to achieve increased public participation in the removal of extraneous sewage flows from private property.

4.1.5 Communications with RAPs:

There are three RAPs in the Niagara River basin: the Buffalo River, the New York Niagara River RAP and the Canada/Ontario Niagara River RAP. The status of the RAPs is as follows:

Remedial Action Plan	Milestone	Target Completion Date	Status
Niagara River, Ontario	Agency review	Feb 1993	Complete
	Submittal to IJC	July 1993	
Niagara River, New York	Submit for public comment	March 1993	Complete
	Final plan	Aug 1993	
Buffalo River	Final plan	Nov 1989	Complete
	Annual reports	1990	Complete
		1991	Complete
		1992	Complete

The individual Niagara River RAPs have appointed several members to an International Advisory Committee. The IAC has met regularly since its first meeting in the fall of 1989. They communicate with both RAP groups on issues and topics of mutual interest. MOEE's representative to the Niagara River Secretariat meets regularly with the IAC and communicates issues with the Secretariat.

4.2 IDENTIFY

The second priority of the plan is to look for significant new sources of toxics to be targeted by the Four Parties for enforcement actions that will further reduce toxic inputs to the Niagara River.

4.2.1 Point Sources:

Available data indicate that point sources contribute only a small fraction of the toxics loadings of the eighteen priority chemicals to the Niagara River. EPA and DEC have proposed a study to better characterize discharges to a major municipal wastewater treatment plant and to track down sources from Combined Sewer Overflows (CSOs) and stormwater drainage.

EPA has examined the discharger-generated Toxics Release Inventory to identify facilities in the Niagara River basin that discharge chemicals with bioaccumulation factor of 1000 or above. Letters are being sent to these facilities asking them to incorporate pollution prevention measures in their processes.

EPA has funded monitoring and modeling on the effects of CSOs in the Buffalo River. This work will help the agencies evaluate whether CSOs are a significant source of priority toxics. A final report estimating mass loadings is expected by the end of 1993.

DEC will use passive samplers to detect individual point sources that discharge certain of the priority toxics (mirex, PAHs, dioxin, and PCBs) as part of a two-year point-source trackdown project beginning in 1993. These samplers are placed at intervals on tributaries to the Niagara River where they indicate the presence or absence of these toxics. Likewise, DEC will use these samplers and low-detection methods of analysis along sewers leading to treatment plants to identify the specific sources of toxics.

All point sources on the Canadian side have been monitored by the MOEE since 1986-87 and are included in the most recent loadings report (July 1993). For the ten chemicals targeted for 50 percent reduction, a greater than 75 percent decrease has been reported; however, greater toxics reductions are anticipated with the implementation of MISA discharge regulations, normal abatement activities and pollution prevention efforts. The MOEE point source monitoring program will continue.

4.2.2 Non-Point Sources:

4.2.2.1 Waste Sites:

While EPA and DEC continue to clean up waste sites estimated to contribute the preponderance of toxics loadings from hazardous sites to the Niagara River, they also seek to identify other major contributors. The Frontier Chemical site on Royal Avenue, Niagara Falls was added to the list of sites to track after extensive groundwater investigations. As sites are cleaned up, the agencies examine new data for follow-on actions.

Although Canadian waste sites are not considered to be contributing NRTMP priority toxics to the Niagara River, more extensive sampling will be carried out to determine the significance of trace levels of several toxics found. Abatement activities continue.

4.2.2.2 Sediments:

DEC and EPA have made contaminated sediments a major program element of the state's strategic plan for the Niagara River basin. Since data indicate that contaminated sediments may be a predominant source of toxics such as PCBs, EPA and DEC are inventorying potential hotspots. The results will be mapped for action-based decisions. EPA and DEC will rank the hotspots and refer them for resolution. Next the agencies will identify and characterize the sources of toxics to the sediments, so that these pathways can be cut off. Finally, the program will evaluate the state policy on dredge material disposal for consistency.

Sediment contamination problems at Canadian sites are being addressed. The MOEE tributary monitoring program verified that, other than in the Welland River basin, sediments do not contribute to toxics loadings to the Niagara River.

4.2.2.3 Tributaries:

EPA and DEC have made source-tracking in Niagara River tributaries another major element in their 1993/1994 program. Passive samplers have proven useful in tracking non-point sources of PCBs in the barge canal system in Western New York.

MOEE's tributary toxics monitoring concluded that Canadian tributaries are not a source of toxics to the Niagara River. Other than in the Welland River basin, no industries discharge process wastewater to the tributaries.

4.2.3 Upstream Loadings - as previously noted on page 9, Representatives from Canadian and U.S. agencies met in April, 1993, to discuss a Lake Erie LaMP. This is a necessary first step to detecting major sources of Four Party priority toxics entering the Niagara River from Lake Erie.

4.3 ASSESS

The third priority of the Plan is to assess the success of programs to reduce the loadings of toxics, ensuring a continuing focus on critical inputs.

4.3.1 Sorting Chemicals

In response to a Niagara River Secretariat charge, the Categorization Committee issued a report in June 1990 on a comprehensive categorization of toxic chemicals for the Niagara River. Based on this categorization, the committee determined that there are 18 toxics that warrant corrective action on a priority basis because they are present in the Niagara River/Lake Ontario ecosystem at unacceptable high levels. As shown in Table I, ten of the priority toxics have significant Niagara River sources. They are the chemicals subject to the 50% reduction commitment in the Declaration of Intent.

Since criteria development and standard setting are an ongoing process, it must be recognized that, in response to new scientific knowledge, many of these numbers will be amended and additional standards and criteria developed. As this occurs, and as new information becomes available from monitoring programs, the Categorization Committee will review and recategorize toxic substances as appropriate.

4.3.2 Reporting Progress

4.3.2.1 Monitoring:

The starting point for measuring progress in reducing toxic chemical loadings to the Niagara River is a coordinated long-term monitoring program in the river itself. Since 1986, EC has operated two water quality monitoring stations at the head (Fort Erie) and mouth (Niagara-on-the-Lake) of the river, using Four Party sampling and analytical and data interpretation protocols. The fifth annual "Joint Evaluation of Upstream/Downstream Niagara River Monitoring Data" report, summarizing concentrations and loadings of 99 chemicals, will be released in July 1993.

Effective April 1993, sampling for volatiles and chlorophenols was discontinued in the Upstream/Downstream Niagara River monitoring program, since these compounds have not been detected at either station since 1989/90. The Four Parties will continue tracking these compounds at sources.

EPA and DEC have recently begun a one-year Fort Erie station representativeness study, sampling at Buffalo Water Intake, to determine if the Fort Erie station is representative of Lake Erie inflow to the Niagara River. The study is being conducted using the same Four Party protocols for sampling, analysis and data interpretation. A final report, comparing the Buffalo Water Intake results to those from the Upstream/Downstream program, is expected in 1995.

4.3.2.2 Reporting:

The first progress report, issued in January 1993, concluded that because data collection programs were not specifically designed to measure 50% reduction, we are unable to report, with confidence, trends over the past four years for all chemicals at this time. This problem is, in large part, caused by extremely low levels of contaminants in the river and sources, levels that are just above or below detection limits of the methods used. Nevertheless, the data can be used to provide a general indication of the changes in the loads of toxics in the Niagara River system. Over time, we may also have increased confidence in using these data sets, including the ambient water quality data, for trends analysis, and to identify candidate chemicals for 50% reduction.

While efforts continue to improve the Niagara River data bases, the reporting framework should be redirected towards:
- reporting on actions taken at sources to reduce toxic loadings; and
- reporting progress on source loadings and ambient levels of those toxics for which we have data, not just the eighteen priority toxics.

Progress in reducing toxics will be best measured by tracking actions to reduce loadings at the sources.

This 1993 Update reports against previous commitments (see Appendix IV), and presents new directions for the Plan.

4.3.3 Commitments for the 1993 Update

4.3.3.1 Data Evaluation:

The Four Parties propose to evaluate NRTMP related programs and initiatives to determine if they meet the commitments of the plan.

4.3.3.2 Buffalo River Pilot Project:

EPA has funded a pilot modeling project for the Buffalo River. Extensive data on ambient water quality, combined sewer overflows, contaminated sediment, flow and sedimentation rates, and fish and wildlife habitat have been generated and used to model the system. A final report, including estimated loadings of individual toxics from the Buffalo River to the Niagara River, is due in September 1993.

4.3.3.3 Biomonitoring:

MOEE and DEC biomonitoring programs have found high local concentrations of certain toxics at identified sources. Biomonitoring will be continued to verify trends in toxics levels and the success of the remediation.

5.0 ORGANIZATION

The Four Parties have established the integrated management structure shown in Figure II to implement the Niagara River and Lake Ontario Toxics Management Plans, and to keep them current. The elements of the structure that are relevant to the NRTMP are described below.

5.1 Niagara River Coordination Committee

The Coordination Committee consists of senior representatives from each of the four jurisdictions. They are publicly responsible for meeting the individual agency and Four Party commitments in the NRTMP.

5.2 Niagara River Secretariat

The Secretariat is the working staff of the Coordination Committee. All NRTMP reporting to the Coordination Committee is done through the Secretariat. It is responsible for drafting NRTMP updates and status reports for review and issuance by the Coordination Committee. The Secretariat will schedule meetings, record and distribute minutes of the meetings and ensure that the Coordination Committee is kept well informed on all activities in the NRTMP.

5.3 Standing Technical Committees

Three committees perform technical activities in support of the NRTMP.

1. River Monitoring (RMC) - The RMC has been responsible for all technical and scientific aspects of the Four Party ambient river monitoring program.

2. Point Source (PSC) - The PSC has been responsible for assisting the Secretariat in coordinating agency activities related to point source loading to the Niagara River.

3. Non-Point Source (NPSC) - The NPSC has been responsible for assisting the Secretariat in reviewing agency activities related to non-point source loadings to the Niagara River.

Since 1987, three other committees have performed technical activities in support of both the Niagara River and Lake Ontario Toxics Management Plans.

4. Categorization (CC) - The CC has categorized toxics for action based on existing data and existing standards and criteria, and has recommended the collection of additional data and the development of new standards and criteria, as appropriate.

5. Standards and Criteria (SCC) - The SCC has reviewed existing standards and criteria for consistency and adequacy relative to the purposes of the Niagara River and Lake Ontario Plans, and has recommended individual agency actions to develop new or revised standards and criteria.

6. Fate of Toxics (FTC) - The FTC has been responsible for developing mathematical models of pollutant fate to relate pollutant inputs to levels of toxics in the ambient water column, sediment and biota.

The NRS will reexamine existing and new committee structures and recommend changes to the Coordination Committee. Detailed revised charges to these committees will be prepared by the Niagara River and/or Lake Ontario Secretariats.

6.0 PUBLIC INVOLVEMENT

The goal of the public involvement process is to facilitate the attainment of our environmental goal for the Niagara River by providing a forum for public consultation and involvement in the continued development and implementation of the NRTMP.

Since the inception of the Niagara River Toxics Management Planning effort, the Four Parties have been committed to public involvement in the development and implementation of the Plan. As the Four Party effort matured, however, it became apparent that improvements could be made in the public involvement process. The Four Parties, therefore, established the Public Involvement Workgroup of agency communication representatives to propose improvements.

In November 1989, after consultation with a number of involved citizens, the Public Involvement work group issued the report Public Involvement Workplan Proposal: Niagara River/Lake Ontario Toxics Management Plan (Bibliography #20). The proposal was accepted by the Coordination Committee, and the work group was asked to develop a work plan implementing the proposal. In April 1990, the work group completed its charge and issued the report Public Involvement Workplan (Bibliography #21).

Consistent with the recommendations of the group, the salient features of the NRTMP public involvement process are described below:

6.1 Citizen Involvement on Standing Technical Committees

In order to facilitate effective public involvement on the six standing technical committees that report to the Coordination Committee:

- Two citizens, one Canadian and one U.S., have been added as full members of each of the committees; their travel expenses are reimbursed consistent with standard government practices.
- Additional interested citizens have been added as correspondents; they receive minutes of meetings and of conference calls, and technical products for review and comment.

Committee membership is reviewed annually.

6.2 Public Involvement in the Formulation of Secretariat Recommendations to the Coordination Committee

In order to ensure effective public involvement in the formulation of Secretariat recommendations to the Coordination Committee, the Secretariat conducts public consultation workshops on the plan updates. In addition, the Secretariat conducts issue-oriented public consultation workshops, as needed.

In each case the Secretariat prepares an Issues for Discussion Document to facilitate a dialogue with the public at the workshop, and a Public Responsiveness Document to summarize the comments received and the actions recommended to address the comments. The Public Responsiveness Document is used to ensure that the Coordination Committee is aware of the public's views at the time it is called on to make policy choices.

6.3 Coordination Committee Open Meetings

Consistent with longstanding practice, the Coordination Committee conducts public meetings in the Niagara area:

- Providing advance notification of meetings;
- Making documents available in advance of the meetings;
- Presenting issues in understandable terms at the meetings; and
- Encouraging questions and comments from the public at the meetings.

These open meetings play a critical role in ensuring public involvement and are a key mechanism for ensuring public accountability.

6.4 Other Outreach Activities

The Four Parties conduct a number of other outreach activities related to the NRTMP:

- The Secretariat maintains a bibliography of all NRTMP documents; copies of the bibliography and all documents will be available at the Repositories listed in Table II.
- Articles about the NRTMP or related projects have been prepared for inclusion in RAP newsletters and other appropriate publications.
- The Secretariat visits RAP sites to discuss the NRTMP.
- The Four Parties continue to update the existing NRTMP mailing list.
- The Four Parties will continue to enhance media relations with respect to NRTMP activities by:
    - Developing press releases prior to meetings and workshops;
    - Ensuring the availability of a media coordinator at these meetings and workshops; and
    - Conducting media availability sessions before public meetings.

6.5 Public Education

The Four Parties also enhance opportunities for public involvement in Niagara River toxics issues through public education.

EPA sponsored an educator's workshop in Buffalo, New York in March 1993 with modules on the toxics problems in the Niagara River basin.

Every segment of the public needs to be acquainted with the health risks associated with ambient levels of toxics. EPA and DEC will publish an advisory pamphlet targeted to populations at highest risk of consuming contaminated fish. This activity is in response to studies of the fish-consumption practices of target populations. The agencies will hand deliver these pamphlets and talk to people individually.

Ontario publishes annually the "Guide to Eating Ontario Sportfish", which gives fish consumption advisories in Ontario waterbodies, including the Niagara River and some of its tributaries.

A State of the Environment Fact Sheet entitled "Trends in contaminant levels in the Niagara River" is being released by Environment Canada at the July 1993 Coordination Committee meeting. This fact sheet presents a history of water quality problems in the Niagara River which lead to its designation as an Area of Concern by the International Joint Commission, and the signing of the Declaration of Intent. Temporal trends of nutrients, trace metals and toxic organic chemicals are described, as well as some of the mechanisms for cleaning up the Niagara River.

Also, in an effort to educate the public on programs in place to monitor the toxics issues in the Niagara River, Canada and Ontario have prepared a 'Canadian Water Quality Criteria' display, as well as an 'Environmental Monitoring - Niagara River' display for the July 1993 public meeting.

TABLE I
NRTMP PRIORITY TOXICS

	N.R. WATER EXCEEDANCES[1]	L.O. FISH EXCEEDANCES[2]	SIGNIFICANT NR SOURCES[3]
o arsenic	X		?
o benz(a)anthracene	X		X
o benzo(a)pyrene	X		X
o benzo(b)fluoranthene	X		X
o benzo(k)fluoranthene	X		X
o chlordane		X	
o chrysene	X		
o DDT & metabolites	X	X	
o dieldrin	X	X	
o dioxin		X	X
o hexachlorobenzene		X	X
o lead	X		?
o mercury	X		X
o mirex/photomirex		X	X
o octachlorostyrene		X	
o PCBs	X	X	X
o tetrachloroethylene	X		X
o toxaphene		X	?

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1 These seven chemicals were identified from a master list of persistent toxic chemicals as exceeding water quality standards, criteria or guidelines at Niagara-on-the-Lake.

2 These nine chemicals were identified from a master list of persistent toxic chemicals as exceeding fish tissue standards, criteria or guidelines in Lake Ontario.

3 These ten chemicals were identified as having significant Niagara River sources, based on a significant positive differential load (i.e., a positive differential load ≥ 25% of the total load as measured at Niagara-on-the-Lake), or based on the existence of known current Niagara River sources.

? The significance of Niagara River sources of these chemicals will be determined based on the data in the Progress Report due December 1990.

TABLE II

NRTMP REPOSITORIES

United States	Canada
U.S. EPA Public Information Office Carborundum Center 345 Third St., Suite 530 Niagara Falls, NY 14303 (716) 285-8842	City of Niagara Falls Planning & Development Dept. Att: Gretchen de Boer 4310 Queen Street Niagara Falls, Ont. L2E 6X5 (416) 356-7521
NYS Dept. of Environmental Conservation 270 Michigan Avenue Buffalo, NY 14202-2999 (716) 851-7000	Niagara River Coordinator Environment Canada 25 St. Clair Ave. East Toronto, Ont. M4T 1M2 (416) 973-1107
Atlantic States Legal Foundation, Inc. 658 West Onondaga St. Syracuse, NY 13204 (315) 475-1170	Niagara River Improvement Project Ontario Ministry of the Environment and Energy 119 King St. East, 12th Floor Hamilton, Ont. L8N 3Z9 (416) 521-7720

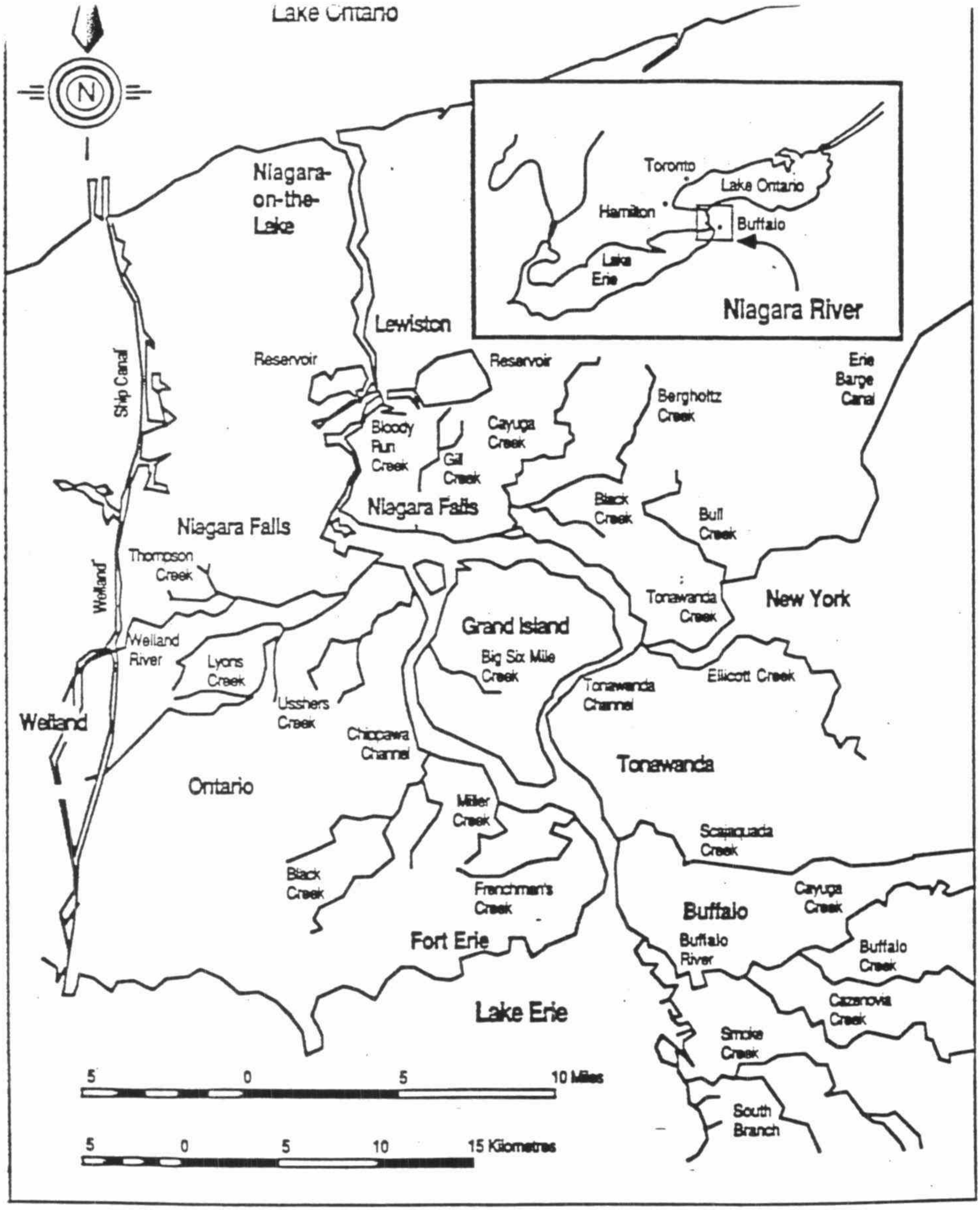
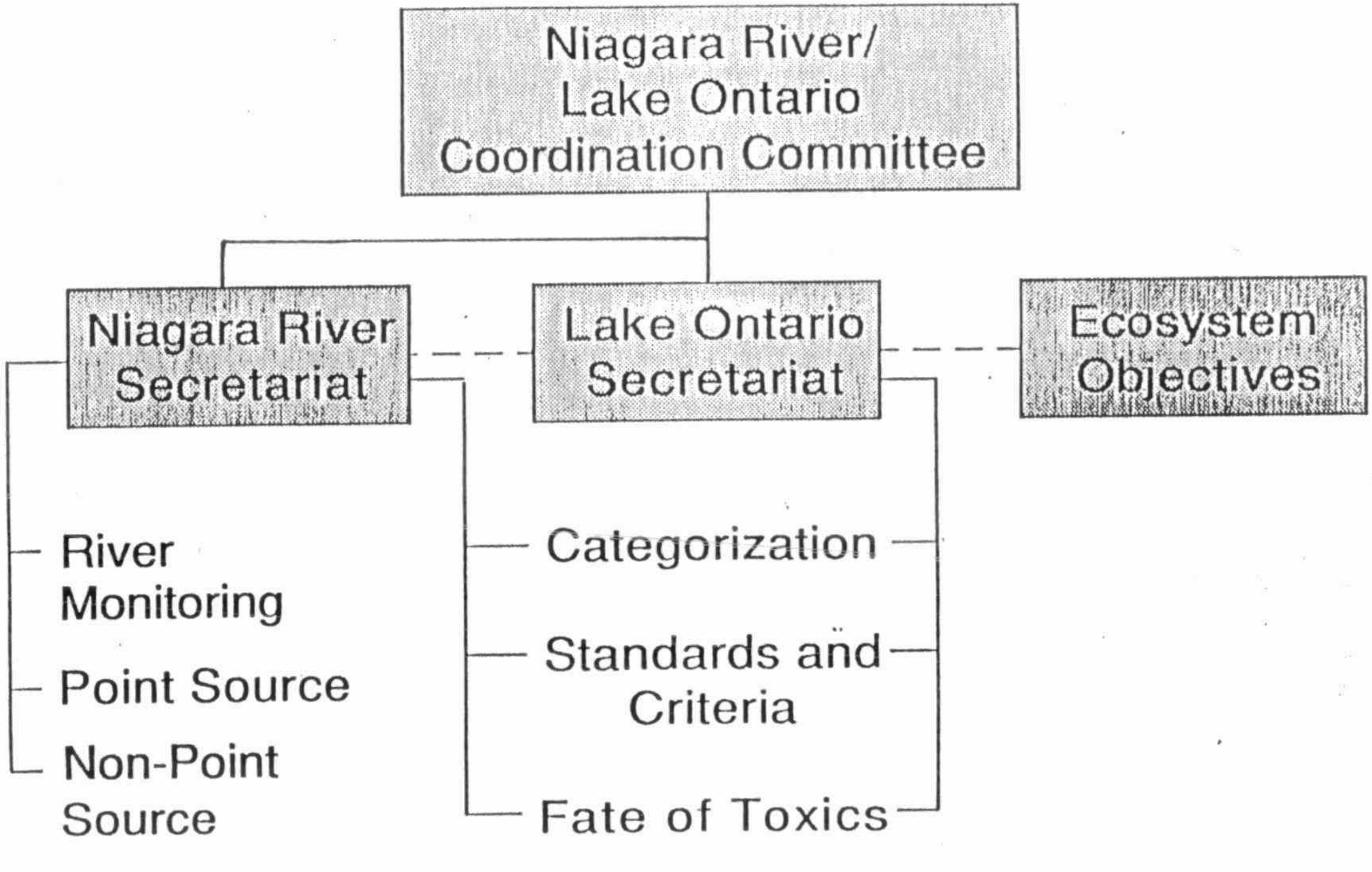


Figure I. Map of Niagara River Area

Figure II.

MANAGEMENT STRUCTURE



DECLARATION OF INTENT
SIGNED FEBRUARY 4, 1987

DECLARATION OF INTENT

BY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ENVIRONMENT CANADA

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ONTARIO MINISTRY OF THE ENVIRONMENT

RELATING TO

THE NIAGARA RIVER TOXICS MANAGEMENT PLAN

INTRODUCTION

The problems of toxic chemical pollution in the Niagara River have been well documented. Major investigations have identified existing and potential sources of toxic pollution along the River, as has work undertaken by the Parties to this Declaration, the International Joint Commission and, more recently, through the Niagara River Toxics Committee (NRTC) report of October 1984.

Numerous studies and investigations undertaken over the years have contributed significantly to the understanding of the complex problems in the river. They have also led to the implementation by the jurisdictions of a wide range of control programs and other measures to reduce the burden of toxic chemicals in the River.

The United States Environmental Protection Agency (EPA), Environment Canada (DOE), the New York State Department of Environmental Conservation (NYSDEC) and the Ontario Ministry of the Environment (MOE) - herein referred to as the Parties - have each identified their respective various programs and activities underway or planned on the Niagara in their responses to the recommendations of the Niagara River Toxics Committee. The Parties continue to undertake activities leading to the reductions of toxic chemical pollutants in both countries in accordance with existing laws and regulations which continue to evolve and which may not be similar in approach.

Under Article II of the Great Lakes Water Quality Agreement of 1978, the governments of Canada and the United States agreed to make a maximum effort to develop programs, practices and technology necessary to eliminate or reduce, to the maximum extent practicable, the discharge of pollutants into the Great Lakes System. This Article also states the policy of the Parties that the discharge of toxic substances in toxic amounts be prohibited and that the discharge of any or all persistent toxic substances be virtually eliminated.

While there are other sources of contamination, the Niagara River is a major contributor of toxic chemical pollutants to Lake Ontario. Public concern over toxics problems in the international waters of the Niagara River and Lake Ontario calls for the unified and collective efforts and will of the four Parties to protect and improve the quality of this valuable resource. Complementary actions carried out in both countries to address these problems include:

- Remedial Action Plans for Areas of Concern identified by the International Joint Commission (IJC);
- United States and Canadian Great Lakes Five Year Strategies;
- Canada-Ontario Agreement on Great Lakes Water Quality;
- Ongoing environmental programs in each jurisdiction.

PURPOSE

The purpose of this Declaration is to ensure that a management strategy is adopted which enables the Parties to move in a directed and coordinated manner toward the objective of achieving significant reductions of toxic chemical pollutants in the Niagara River in accordance with timetables and specific activities. The Parties commit themselves to using the authority provided by their domestic laws and regulations to this end. This is consistent with the goal of virtual elimination of toxic discharges, as agreed upon in 1978 by the Governments of the United States and Canada under the Great Lakes Water Quality Agreement.

In October 1986, the Parties released the first edition of a four-party Work Plan which establishes timetables and a set of specific activities to be undertaken. This Declaration in conjunction with that document, together form The U.S. - Canada Niagara River Toxics Management Plan, hereinafter referred to as the The Plan. (See Appendix 1).

THE PARTIES DECLARE THEIR INTENT TO:

Adopt and implement The Plan as a dynamic and evolving framework within which the United States and Canadian agencies will cooperatively take appropriate steps leading to a significant reduction in toxic chemical pollutants from point and non-point sources to the Niagara River, in a manner consistent with federal, state and provincial laws.

In so doing, and in order to achieve the goals of The Plan as stated in this Declaration of Intent, the Parties will:

1. Jointly establish a common basis for identifying, assessing and quantifying toxic chemical loadings into the Niagara River;

   Individually identify and establish priorities for control measures to reduce loadings;

   Individually implement chemical pollutant control activities in the Niagara River;

   Individually and jointly monitor and evaluate the success of control activities.

2. Take into account applicable water quality and drinking water standards and set as a target a reduction level of 50% for

persistent toxic chemicals of concern* from point sources in Ontario and New York by the year 1996. This achievement will depend on the progressive evolution of technologies, permits, standards, laws, and regulations in both countries.

3. Report by July 1987 and each year thereafter on progress made in identifying and quantifying loadings of toxic chemical pollutants originating from non-point sources in Ontario and New York. To this end, the Parties will work towards achieving a reduction of at least 50% of persistent toxic chemicals of concern* by the year 1996 taking into account siting issues, technology available, laws and regulations.

4. Establish an improved system of monitoring to ensure the effectiveness of all monitoring programs and schedules.

5. Enforce laws and regulations to ensure the maximum reductions in loadings. In general, point source control measures will be based upon the application of existing best available technology and the results of scientific evidence of environmental degradation. The Plan will be updated to reflect developments in these areas.

6. Use The Plan as a means of alerting the jurisdictions to those chemicals for which reductions are not occurring, so that appropriate corrective actions can be taken.

7. Review and update The Plan on an annual basis. As part of the review a progress report will be published and public input sought. The report will include an implementation schedule proposed for the coming year, the results of monitoring, a list of actions undertaken with respect to point and non-point sources, updated information on chemicals of concern, and scientific evaluations of new and developing technologies relevant to the program.

8. In 1988 and annually thereafter, review and report in depth (based to the maximum extent possible on existing Parties' reporting requirements) on the state of new and emerging technologies applicable to hazardous waste landfill site remediation with particular emphasis on such techniques as the excavation, removal, and on-site destruction of contaminated material.

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* A mutually agreed upon list of persistent toxic chemicals of concern will be developed from:

i) NRTC Group I and II lists of chemicals of concern;

ii) IJC Water Quality Board's 1985 list of "Critical Pollutants";

iii) Results of point and non-point source monitoring activities underway.

9. Submit The Plan and progress reports to the International Joint Commission as part of the Commission's Remedial Action Plan program for the Great Lakes.

10. Adopt the following goals for each component of The Plan:

a) River Monitoring

- determine the toxic chemical loadings to the Niagara River from Lake Erie (input);
- determine toxic chemical loadings from the Niagara River to Lake Ontario (output);
- determine toxic chemical loadings from sources along the Niagara River by comparing the difference between the output from the river and input from the river from upstream sources (input-output differential river monitoring identified by the NRTC);

Attempts will be made to determine the loadings with sufficient confidence to measure the effectiveness of the control programs.

b) Point Sources

- determine toxic chemical loadings from industrial and municipal facilities;
- estimate allowable toxic chemical loadings from industrial and municipal sources as provided in regulatory specifications;
- estimate reduction of toxic chemical loadings as a result of implemented control measures and scheduled reductions based on planned control measures;
- implement remedial and control programs so as to achieve the maximum possible reduction of toxic chemical loadings to the Niagara River;

c) Non-Point Sources

- estimate toxic chemcial loadings from tributaries and leaking hazardous waste disposal sites;
- estimate reductions in toxic chemical loadings as a result of implemented control measures, and scheduled reductions based on planned control measures;

- implement remedial and control programs so as to achieve the maximum possible reduction of toxic chemical loadings to the Niagara River. In addition, on all sites, excavation, removal and destruction of contaminated material will be considered as a means of eliminating contaminants to the river.

d) Chemicals of Concern

- identify and maintain a list of chemicals of concern (as determined by the NRTC, with further monitoring, research and priorities established by the IJC Water Quality Board) within the Niagara River ecosystem and promote the establishment of uniform environmental and human health criteria for those chemicals.

e) Technical and Scientific Cooperation

- carry out research, technical and scientific programs to assist the four jurisdictions in addressing the problems of the Niagara Frontier.

f) Communication Plan

- present information and scientific reports to the public, and seek their input to The Plan.

g) Organization and Implementation

- establish and maintain a management structure to ensure that the implementation of The Plan is effectively monitored.

h) Reporting

- update The Plan annually and issue status reports at the beginning of each calendar year.

11. Initiate activity on a Lake Ontario Toxic Management Plan which will be similar in content and scope to the Niagara River Toxics Management Plan and compatible with IJC activities. The Lake Ontario document will be completed by January 1, 1988.

Executed this 4th day of February, 1987

For the United States
Environmental Protection Agency

Lee M Thomas

Mr. Lee Thomas
Administrator

For Environment Canada

Tom McMillan

The Honourable Tom McMillan
Minister

For the New York State Department
of Environmental Conservation

Henry G. Williams

Mr. Henry G. Williams
Commissioner

For the Ontario Ministry of the
Environment

Jim Bradley

The Honourable Jim Bradley
Minister

APPENDIX II

Accomplishments to Date

September 1990 - July 1993

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
I. Sort Chemicals as a Basis for Action			
I-100 Prepare Categorization of Chemicals Report			
- Initial comprehensive report	Categorization Committee	May 1990 COMPLETED	Report Completed, June 1990, "Categorization of Toxic substances in the Niagara River". NRS response: "Proposed Actions In Response to the June, 1990 Categorization of Toxic Substances in the Niagara River," Sept., 1990
- Annual update	NRS		Current focus is on tracking and cleaning-up actions for all bioaccummulative persistent toxics and implementing pollution prevention.
I-110 Report on adding to 50% reduction list for priority toxics			
- 1990 Report	NRS	Dec 1990 COMPLETED	Activity completed and included in Jan. 1993 report: "Progress Report on Reduction of Priority Toxics in the Niagara River". Follow-on arsenic and chrysene is carried forward as C-1.
- Annual update	NRS	Dec 1991	Not necessary. See comment above in I-100.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
II. Implement Programs to Reduce the Loadings of Toxics Entering the Niagara River			
II-100 Prepare U.S. point source plan			
- Final plan	EPA/DEC	Sept 1990	Interim report: "Reduction of Toxic Inputs to the Niagara River from Point Sources", DEC/EPA, June 1989. Identifies how the 50% commitment will be met. Final report will be released after permit is issued to the Niagara Falls Waste Water Treatment Plant. Follow-on activity: Pilot project to better characterize major point source discharges was recommended in the Jan. 1993 Progress Report and is carried forward as B-1a.
- Status report and plan update	EPA/DEC	Sept 1991	
II-110 Prepare Canadian point source plan			MOE June 1989 report, "Priority Toxic Chemicals of Concern from Ontario Point Sources Discharging to the Niagara River". Updated Dec. 1989.
- Status report and plan update	MOEE	Dec 1990 COMPLETED	Updated loadings presented in Jan. 1993 Progress Report - 5 year status report projected for 1993.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
II-200 Prepare U.S. waste sites report			
- Refine loadings estimates to be chemical-specific	EPA	COMPLETED Nov 1990	"Reduction of Toxics Loadings to the Niagara River from Hazardous Waste Sites in the US: A Progress Report." March 1993. Where data allowed, total loadings based on more accurate chemical-specific data were included in the report. Status report annually on clean up of waste sites. Follow-on: EPA and DEC will examine data for sites and publish new loadings estimates where data allows. Projected completion date: Dec. 1993
- Annual status report and plan update	EPA/DEC	annually	
II-210 Prepare Canadian waste sites report			
- Initial report	MOEE	COMPLETED Sept 1990	"Potential Contaminant Loadings to the Niagara River from Canadian Waste Disposal Sites," Jan 1991
- Annual status report and plan update	MOEE	COMPLETED Sept 1991	"Status of Discharges and Landfills" Fact Sheet available at Jan 1993, Coordination Committee meeting. Report on update on sampling and loadings scheduled for July, 1993.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
II-300 Prepare U.S. report on other non-point source control programs			
- Annual status report, and plan update	EPA/DEC	June 1991	"Summary of EPA/DEC Accomplishments in the Great Lakes" available at Jan. 1993 Coordination Committee meeting. Activities are detailed in the 1993 NRTMP Update. Tributaries: Gill Creek cleanup, 1992; Bloody Run Creek cleanup, 1992; Buffalo River projects. Rural non-point: Agricultural technical assistance to Erie County (EPA WRITAR program). EPA funded Clean Sweep pilot, Erie County. Follow-on activities: Sediments: EPA-funded Soil Conservation Service position at DEC to gather source and loadings data. Rural: Clean Sweep to be extended basinwide. Tributaries: Current U.S. action plan emphasizes source trackdown in tributaries.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
II-310 Prepare Canadian report on other non-point source control programs			
- Initial report	MOEE/DOE	DEC 1990 COMPLETED	Reported in Jan., 1993, "Progress Report on Reduction of Priority Toxics in the Niagara River".
- Annual status report and plan update	MOEE/DOE	DEC 1991 COMPLETED	Report on toxics monitoring in tributaries scheduled for July 1993. - Contaminated sediment removal demonstration project carried out in Welland River in 1992. - Municipalities carrying out Infrastructure Needs Studies. - Report "Environmental Evaluation of Lower Welland River", to be released July 1993.
II-400 Formulate specific recommendations to ensure that the responsible jurisdictions address the inter-lake transport issue	NRS	DEC 1990 COMPLETED	Representatives from Canadian and US agencies met on April 26-27, 1993 to discuss a Lake Erie LAMP.

ACTIVITY/OUTPUT		RESPONSIBLE PARTY	COMPLETION DATE	STATUS
II-500	Undertake Niagara River/Lake Ontario Pollution Prevention Initiative			
-	Develop proposal	NRS/LOS	Oct 1990	Individual Agency Activities EPA: Targeted facilities for pollution prevention (P2) inspection and waste minimization activities. Sponsored P2 programs in Erie County: agricultural pesticide clean sweep and P2 training for wastewater pretreatment inspectors. MOEE: Established Pollution Prevention (P2) Office and launched its P2 Pledge and other programs. MISA program broadened to include pollution prevention activities. DEC: Established Multi-media/ Pollution Prevention unit in 1992. DEC has drafted P2 regulations which include a requirement that industries submit plans to reduce hazardous waste and release of toxics.
-	Implement proposal	NRS/LOS	to be determined	

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III. Assess the Success of Programs to Reduce the Loadings of Toxics, Ensuring a Continuing Focus on Critical Inputs			
III-100 Prepare Upstream/Downstream Report			
- Report for Apr 1988 - Mar 1989	RMC	Sep 1990 COMPLETED	"Joint Evaluation of Upstream/Downstream Niagara River Monitoring Data 1988-1989", 4 Party Report, Dec 1990
- Report for Apr 1989 - Mar 1990	RMC	Jun 1991 COMPLETED	"Joint Evaluation of Upstream/Downstream Niagara River Monitoring Data 1989-1990" 4 - Party Report March 1992
- Re-analysis of data from prior years in accordance with 50% Reduction Framework	RMC	Oct 1990 COMPLETED	RMC data, published in accordance with 50% reduction framework, in "Progress Report on Reduction of Priority Toxics in the Niagara River, Jan 1993.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-110 Prepare point source loadings report	PSC	Sep 1990 COMPLETED	"Niagara River Point Source 50% Reduction Progress Report," September 1990, 4-Party. The 4 Party Report, "Progress Report on Reduction of Priority Toxics in the Niagara River", Jan. 1993, summarizes point source loadings and presents recommendations for improvements in programs. Follow-on Activities DEC has proposed a workplan for a pilot project to better characterize discharges and sources. The Four Parties will reexamine monitoring and sampling data for Four Party direction.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-120 Development of a comprehensive report on non-point source loadings			
A. Develop initial estimates based on readily available information	NPSC	Oct 1990	EPA contracted for a non-point source loadings estimations methodology on behalf of the 4 Parties. The data bases were inadequate to permit such estimations. EPA has begun a redirected effort using the Buffalo River as a pilot focus. - DEC report, "An Automated Sampling System for Trace Contaminant Load Estimation - Buffalo River, Buffalo, NY" Dec. 1992. - EPA funded modeling to culminate in loadings report in Sept. '93 (J. DePinto, University of Buffalo) Based on the results of modeling, effort may be expended to basin. - Follow-on: The Four Parties will task monitoring and sampling experts to reexamine data for Four Party direction.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
B. Develop a workplan for improving these estimates	NPSC	Oct 1990	Improved loadings could follow from activity II-120A. The Four Parties decided to focus on load reduction and identification of sources.
C. Develop improved U.S. non-point source loadings estimates according to the workplan	EPA/DEC	To be determined	
D. Develop improved Canadian non-point source loadings estimate according to the work plan	MOEE/DOE	To be determined	
E. Develop improved estimates of total U.S. and Canadian loadings that build on detailed U.S. and Canadian efforts.	NPSC	To be determined	

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-130 Report on Gains/Losses	Fate of Toxics Committee	Nov 1990 COMPLETED	"Modeling Transport and Exposure of Substances in the Niagara and Lake Ontario", Parkerton and Di'Toro, Manhattan College, Sept. 1990.
III-140 50% Reduction Progress Report	NRS	Dec 1990 COMPLETED	"Progress Report on Reductions of Priority Toxics in the Niagara River", Jan. 1993, 4-Party. Follow-on: The Four Parties will reexamine monitoring and sampling data for Four Party direction.

ACTIVITY/OUTPUT		RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-200	Conduct Ft. Erie Station Representativeness Study			
-	Complete Data Collection	RMC	Mar 1991	DEC and EPA have funded a Ft. Erie representativeness study that uses a RMC - approved workplan. Expected completion date is November 1994. The RMC will review the results and make recommendations to the NRS.
-	Draft Report	RMC	Jan 1992	
-	Final Report	RMC	Mar 1992	
III-300	Resolve Ambient Data Detection Level Issues	RMC	To be established	"Analytical Protocol for Monitoring Ambient Water Quality at the Niagara on-the-Lake and Ft. Erie stations, " Nov. 1992, EC. Updates protocols to incorporate analytical improvements.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-400 Recommend development of standards and criteria			
- Screen category IE Chemicals to identify those warranting criteria development	SCC	Mar 1991	The 1990 report of the Standards and Criteria Committee presents screening criteria.
- Resolve inadequacies and inconsistencies in standards and criteria for category IA and IB chemicals			
- Identify priority activities and responsible parties	NRS	COMPLETED Sept 1990	"Proposed Actions in Response to the March 31, 1990 'Standards and Criteria Report to the Secretariats'," Sept. 1990, Niagara River and Lake Ontario Secretariats. The U.S. has developed Great Lakes guidance criteria and published in the Federal Register.
- Implement recommendations	All Agencies	To be determined	The Binational Executive Committee (BEC) is trying to reach agreement to resolve inadequacies, etc.

ACTIVITY/OUTPUT		RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-500	Monitor for additional chemicals			
-	Screen Chemicals in the Niagara River for potential addition to the Upstream/Downstream Network	RMC	Mar 1991	EPA (Region 2, ESD) is conducting this work for RMS. Lab difficulties forced a search for a new lab. Work is underway. Report expected Dec. 1994.
-	Expand chemicals sampled in the Upstream/Downstream network, as necessary, based on the recommendations of the Data Interpretation Group, the recommendations included in the Categorization report (Activity I-100), and the results of the screening analyses cited above.	RMC	To be determined	The River Monitoring Committee started their monitoring and analysis with 59 contaminants. They presently monitor 99 contaminants. In seeking efficiency of operations, they are considering reevaluating chemicals to be monitored.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-600 Evaluate need for a biomonitoring program	NRS	Nov 1990 COMPLETED	The NRS determined that biomonitoring cannot be used to quantify toxic reductions. MOEE publishes a biennial report on this biomonitoring in the Niagara River. The individual agencies are using biomontoring to evaluate effectiveness of remedial measures, and will present recommendations for further sampling.
III-700 Develop Niagara Falls, New York Groundwater Model	EPA	Sep 1991 COMPLETED	"Simulated Three-Dimensional Ground-Water Flow in the Lockport Group, A Fractured Dolomite Aquifer near Niagara Falls, New York." USGS, 1993.

ACTIVITY/OUTPUT		RESPONSIBLE PARTY	COMPLETION DATE	STATUS
III-800	Compare existing Niagara River downstream load to estimates of the load that would allow attainment of standards and criteria in Lake Ontario			Modeling Charts available.
-	Comparison based on Level I estimates	NRS	Dec 1990 COMPLETED	
-	Comparison based on Level II estimates	NRS	To be determined	The Four Parties will re-examine monitoring and sampling data for Four Party direction.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	STATUS
IV. Coordinate NRTMP Activities with RAP Activities			
IV-100 Annual Progress Reports on RAPs			
- Niagara River			
- Ontario	MOEE/EC	July 1990	Stage I draft, February 1993.
- New York	DEC	July 1990	Stage I draft, April 1993.
- Buffalo River	DEC	July 1989	Annual updates available for '90, '91, '92.
IV-110 Actions based on Coordination Committee review of the RAP Progress reports			
- Recommendations to RAPs - Actions on recommendations from RAPs	NRS NRS	Ongoing Ongoing	MOEE representative to the NRS meets regularly with the International Advisory Committee (IAC) for Niagara River RAPs and the NRS meets yearly with the IAC for Niagara River RAPs. Annual meetings of RAP Coordinators with NRS planned on toxics issues. State and Provincial Secretariat members are key RAP personnel. NRS has agreed that non- river-wide exceedances of toxics criteria, standards or guidelines will be referred to the individual RAPs.

Appendix III

Niagara River Toxics Management Plan

1993 UPDATE

Table of Commitments

NRS=Niagara River Secretariat
LOS=Lake Ontario Secretariat
RMC=River Monitoring Committee
PSC=Point Source Committee
NPSC=Nonpoint Source Committee
CC=Categorization Committee
FTC=Fate of Toxics Committee
SCC=Standards and Criteria Committee

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
A. Reduce the Loadings of Toxics Entering the Niagara River from Known Sources			
A-1 Point Sources			
A-1c Ensure that the Niagara Falls Wastewater Treatment Plant is treating all dry-weather flow from the Falls Street Tunnel.	EPA/DEC	Oct 1993	This treatment will reduce NRTMP priority toxics by 70 to 100 percent from the largest point source contributor to the Niagara River.
A-1b Implement Ontario's Municipal/Industrial Strategy for Abatement (MISA)	MOEE		MISA affects wastewater treatment discharges. The program was expanded to include pollution prevention, prevention of cross-media transfer of toxics, and chemical bans and phase-outs.
A-1a Implement the US Great Lakes Water Quality Guidance			
- Publish final Guidance	EPA	Apr 1994	The Draft Guidance has been published for public comment. Bioaccumulation factors have been used in calculating criteria.
- Adopt proposed water quality criteria and controls	DEC	Apr 1996	Great Lakes states will have two years to adopt the proposed water quality criteria and controls that are consistent throughout the Great Lakes. NYSDEC will implement GLWQI antidegradation policies and procedures prior to the two-year deadline.
A-1d Reduce toxics from point sources identified in Activities B-1	EPA/DEC/ MOEE	As identified	

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
A-2 Non-Point Sources			
A-2a Prepare update of US waste site report	EPA/DEC	annually	The update will report on progress in remediating waste sites in the U.S. The report will also publish improved loading estimates, where data allow.
A-2b Clean up contaminated Welland River basin sediments	EC/MOEE	1994/95	A committee was formed to oversee clean-up. A technology demonstration project was successful.
A-2c Reduce toxics from non-point sources identified in Activities B-2	EPA/DEC/ MOEE	as identified	
A-2d Complete Erie County pesticide Clean Sweep program			
- Final report	Erie County	Dec 1993	
- Evaluate for Great Lakes-wide program	Erie County EPA/DEC	Mar 1994	
- Implement basinwide	EPA/DEC	to be determined	
A-2e Conduct practice exercise for containing an emergency spill to the Niagara River	EPA/EC	Jun 1993	Binational cooperative drill to test notification and tracking procedures.
A-2f Publish final new substances regulations under CEPA	EC	Dec 1993	This will require pre-screening of new substances for their environmental or health defects prior to introduction into the marketplace.

CTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
-3 Upstream Loadings			
-3a Encourage U.S. and Canadian agencies to establish programs to identify the sources of toxics loads to the Niagara River through Lake Erie	EC/MOEE EPA/DEC		The responsible agencies have met to discuss a Lake Erie LaMP.
- Report annually on progress in developing these programs	Four Parties	Jul 1994	

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
A-4 Pollution Prevention			
A-4a Continue US pollution prevention activities	DEC/EPA	continuous	Activities include multi-media inspections, the 33/50 voluntary initiative, conferences for industry, development of regulations for P2 planning, and training of pre-treatment inspectors of wastewater treatment plants.
- Report on multi-media inspections	EPA	Jul 1994	
- Report on 33/50 voluntary initiative	EPA	Jul 1994	
- Report on industry conferences	DEC	Jul 1994	
- Report on development of regulations for pollution prevention	DEC	Jul 1994	The Multi-Media/Pollution-Prevention Unit established in 1992 is developing regulations requiring industries to develop plans to reduce their generation of hazardous waste and releases of toxic substances to air, land and water.
- Report on P2 training of municipal pretreatment inspectors	EPA/Erie County	Jul 1994	
A-4b Continue Canadian pollution prevention activities	MOEE EC	continuous	MOEE's Pollution Prevention Office instituted a Pollution Prevention Pledge Program which calls for voluntary reductions of toxic discharges.
- Report progress	MOEE EC	annually	
A-5 Implement Public Awareness Program for Fish Consumption Advisories Targeting Particular Populations at risk	EPA/DEC	1993	DEC and EPA are conducting a pilot project to better inform target groups about Great Lakes fish consumption advisories.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
A-6 Ensure NRTMP-RAP consistency			Remedial Action Plans (RAPs) provide a plan for provincial, state, and local activities.
A-6a Continue to liase with RAP teams and NRAC/PAC	DEC MOEE	continuous	
A-6b Report on progress of RAPs	DEC/MOEE	annually	

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
B. Identify Additional Sources of Toxics to be Targeted for Enforcement/Reduction Actions			
B-1 Point Sources			
B-1a Identify sources of toxics discharges to U.S. sewage treatment plants			
- Examine existing pretreatment data	EPA/DEC		DEC will reevaluate pretreatment program data for substances of concern and potential source identification.
- Develop a pilot project to identify specific sources of priority toxics to treatment plants using low-level detection limits.	DEC/EPA		The objective is to better characterize point source discharges, using lower detection limits and moving up the waste stream to identify sources.
B-1b Determine if CSOs are a source of priority toxics to the Buffalo River	EPA	Dec 1993	The effects of CSOs are being evaluated within the pilot modeling project for the Buffalo River which will help to determine if they are a significant source of priority toxics.
B-1c Identify potential CSO system modifications to eliminate CSO inputs of toxics to the Buffalo River	DEC/ NR RAP	Mar 1994	The Buffalo Sewer Authority will use its CSO model to assess capacity and identify potential for enhanced in-system storage.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
B-2 Non-Point Sources			
B-2a Implement EPA/DEC Contaminated Sediment Program			
- Inventory and map sediment hot spots	DEC/EPA	Mar 1994	EPA and DEC will rank the hotspots for action-based decisions.
- Prioritize the hot spots for action-based decisions	DEC/EPA	Mar 1994	
- Develop strategy to address hot spots	DEC/EPA	Mar 1994	
- Identify pathways to the contamination of sediments	DEC/EPA	Mar 1994	
- Evaluate the state policy on dredge material disposal	DEC/EPA	Mar 1994	
B-2b Identify any other hazardous waste sites that potentially require priority attention based on new information	EPA/DEC	ongoing	As an example, the Frontier Chemical site was identified as a priority site in 1992.
B-2c Continue biomonitoring programs to identify potential additional toxics for ambient monitoring	MOEE DEC		MOEE biomonitoring carried out biennially along the Niagara River and in some tributaries.
B-2d Track down sources of toxics in tributaries	EPA/DEC	Dec 1993	The PISCES tool has proven useful in identifying sources of PCBs and other hydrophobic toxics in tributaries.
B-2e Identify specific persistent toxic substances that are candidates for substance bans	EPA/DEC	Mar 1994	A report will give analytic bases for ban, restrictions, etc.

ACTIVITY/OUTPUT		RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
C.	Assess the Success of Programs to Reduce the Loadings of Toxics, Ensuring a Continuing Focus on Critical Inputs			
C-1	Reinvestigate the categorization of chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, and arsenic	Categorization Committee		There are analytic problems in differentiating chrysene from another substance, and differentiating benzo(b)fluoranthene, benzo(k)fluoranthene from each other. Arsenic has natural as well as industrial sources.
C-2	Continue biomonitoring at remediation sites: waste sites, point sources, tributary mouths, etc.	MOEE DEC	continuous	Biomonitoring will be used to confirm the effectiveness of cleanups.
C-3	Evaluate NRTMP-related programs and initiatives for meeting commitment goals	4-P	Jun 1994	The intention is to solicit additional guidance from experts in evaluation of existing data to answer management questions.

ACTIVITY/OUTPUT	RESPONSIBLE PARTY	COMPLETION DATE	COMMENT
C-4 River Monitoring Committee Activities			
C-4a Prepare annual Upstream/Downstream reports	RMC	annually	
C-4b Conduct the Fort Erie representativeness study - final report	RMC	 Apr 1995	This project, funded by EPA, is being conducted according to a Four Party workplan. DEC will do the statistical analysis. The final report will be a Four Party product.
C-4c Monitor for additional chemicals			
- Screen chemicals in Niagara River for potential addition to the upstream/downstream monitoring network	EPA	Dec 1993	
- evaluate list of chemicals measured in upstream/downstream network, and make recommendations for adjustments as necessary	Group B task force RMC	continuous	33 new chemicals were added to the list of 66 since 1987/88. Volatiles/chlorophenols analysis discontinued April 1993 due to non-detects. The NRS will evaluate the impact on the NRTMP.
C-4d Conduct field and lab audits	Groups A & B task force RMC	biennially	
C-4f Develop a method for trend analysis over the years for chemicals of concern	RMC	Dec 1993	

NRTMP
BIBLIOGRAPHY

I. COMMITMENTS IN THE NIAGARA RIVER TOXICS MANAGEMENT PLAN 1988 REVISION

1) U.S. Environmental Protection Agency (EPA). February 1988. **The Superfund Innovative Technology Evaluation Program: Progress and Accomplishments**.

2) Ontario Ministry of Environment (MOE). January 1989. **Inventory of Innovative Hazardous Waste Site Remediation and Measurement and Monitoring Technology Projects in Ontario**.

3) New York Sate Department of Environmental Conservation (NYSDEC). February 1989. **Nonpoint Source Assessment Report**.

4) Niagara River Coordination Committee. March 1989. **Letter to the International Joint Commission.**

5) River Monitoring Committee. May 1989. **Field and Laboratory Audits.**

6) River Monitoring Committee. May 1989. **Joint Evaluation of Upstream/Downstream Niagara River Monitoring Data 1987-1988**.

7) Environment Canada. April 1989. **Hazardous Waste Site Remediation: Innovative Technology Development**.

8) River Monitoring Committee. June 1989. **Memorandum to the Niagara River Secretariat on agency biomonitoring programs.**

9) NYSDEC and U.S. EPA. June 1989. **Reduction of Toxic Inputs to the Niagara River from Point Sources, Interim Report**.

10) MOE. June 1989. **Update Report: Priority Toxic Chemicals of Concern From Ontario Point Sources Discharging to the Niagara River 1988**.

11) River Monitoring Committee. June 1989. **Memorandum to the Niagara River Secretariat transmitting the Seastar Report on Determination of Concentrations Across the Niagara River Using Automatic In Situ Water Samplers, April 1988**.

12) NYSDEC. August 1989. **1987-1988 Toxic Substance Discharges From Point Sources to the Niagara River.**

13) Nonpoint source Committee. September 1989. **Nonpoint Source Committee Report to the Niagara River Secretariat**.

14) NYSDEC. November 1989. **Buffalo Remedial Action Plan**.

15) Niagara River Secretariat. November 1989. **A Framework for The Niagara River 50% Reduction Progress Report.**

16) U.S. EPA and NYSDEC. November 1989. **Reduction of Toxics Loadings to the Niagara River from Hazardous Waste Sites in the United States**.

17) MOE. December 1989. **Update Report: Reduction of Toxic Chemicals from Ontario Point Sources Discharging to the Niagara River 1988**.

18) NYSDEC. January 1990. **Nonpoint Source Management Program**.

19) Standards and Criteria Committee. March 1990. **Standards and Criteria Committee Report to the Secretariats**.

20) Public Involvement Workgroup. November 1989. **Public Involvement Workplan Proposal Niagara River/ Lake Ontario Toxics Management Plans**.

21) Public Involvement Ad Hoc Working Group. April 1990. **Public Involvement Workplan**.

22) Categorization Committee. June 1990. **Categorization of Toxic substances in the Niagara River**.

23) NYSDEC. August, 1990. **1988-1989 Toxic Substance Discharges From Point Sources to the Niagara River**.

24) Niagara River and Lake Ontario Secretariats. September 1990. **Proposed Actions In Response to the June, 1990 Categorization of Toxic Substances in the Niagara River**.

25) Niagara River and Lake Ontario Secretariats. September 1990. **Proposed Actions in Response to the March 31, 1990 Standards and Criteria Report to the Secretariats'**.

26) Parkerton and Di Toro, Manhattan College. September 1990. **Modeling Transport and Exposure of Substances in the Niagara and Lake Ontario**.

27) Point Source Committee. September 1990. **Niagara River Point Source 50% Reduction Progress Report**.

28) River Monitoring Committee. December 1990. **Joint Evaluation of Upstream/Downstream Niagara River Monitoring Data 1988-1989**.

29) MOE. January 1991. **Potential Contaminant Loadings to the Niagara River from Canadian Waste Disposal Sites**.

30) NYSDEC. August 1991. **1989-90 Toxic Substance Discharges from Point Sources to the Niagara River**.

31) U.S. Geological Survey. 1991. **Stimulated Three-Dimensional Ground-Water Flow in the Lockport Group, A Fractured Dolomite Aquifer near Niagara Falls, New York**.

32) River Monitoring Committee. March 1992. **Joint Evaluation of Upstream/Downstream Niagara River Monitoring Data 1989-1990**.

33) River Monitoring Committee. November 1992. **Analytical Protocol for Monitoring Ambient Water Quality at the Niagara-on-the-Lake and Ft. Erie stations**.

34) NYSDEC. December 1992. **An Automated Sampling System for Trace Contaminant Load Estimation - Buffalo River, Buffalo, NY**.

35) Niagara River Ad Hoc Work group. January 1993. **Progress Report on Reduction of Priority Toxics in The Niagara River**.

36) USEPA and NYSDEC. January 1993. **Summary of EPA/DEC Accomplishments in the Great Lakes**.

37) MOEE. January 1993. **Status of Discharges and Landfills, Fact Sheet.**

38) USEPA and NYSDEC. March 1993. **Reduction of Toxics Loadings to the Niagara River from Hazardous Waste Sites in The US: A Progress Report**.

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